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. . . the cause of democratic education . . .

How Different Should Our Children Be?

HAROLD R. W. BENJAMIN*

IF WE ASK American parents the simple question contained in this title and if we ask it in such a way that they have time to ponder their answers deliberately, their views are likely to surprise both them and us. I am not speaking of the ready-made, "off-the-cuff" replies that many of our citizens give easily to questions involving the children and young people of the country in general. I am speaking rather of the answers that parents furnish (not only in words but more importantly in deeds) when their own children—that little eight-year-old girl who looks like her mother and that twelve-year-old boy who acts like his grandfather—are involved.

When it is merely a question of children in the mass—other people's children—the ordinary citizen falls easily into the ancient error of regarding them as beings who can and should be made very much alike in a large number of ways. This error is based squarely on the notion that it is possible and desirable to machine human beings as if they were to be used as cogs, pegs, and interchangeable parts in all kinds of situations. This error involves also the belief that education, properly organized and applied, will cause children to react uniformly to uniform instruction and that the right pressures, skilfully brought to bear, will level off differences among them. The difficulty with this view is that it has very few facts to support it. Human beings are alike in many ways, but, in many other ways, they are very different. They are so different that every individual is unique. They cannot learn at uniform speeds, they do not react uniformly to the same stimuli, and they are never uniformly educated by a uniformly-applied curriculum. All the available evidence suggests that, whenever a uniform education is desired, the curriculum must be nonuniform and flexible.

Most intelligent parents recognize these truths as applied to their own children. They have lived with that little girl for eight years. They know that, although she looks like her mother, she is different from her mother and from everyone else. They have observed that boy for twelve years, and, although he reminds them of his grandfather, they know full well that he is not the same kind of person. They

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are aware that each of these children is an unprecedented product, never found before in all human existence and never to be duplicated in all the centuries of the world to come. Of course, parents who have this ability to recognize the unique capacities of their children want those capacities to be developed to the best and fullest extent. They do not expect nor desire their children to become more like everyone else as they grow older. They hope that—at ages twenty, thirty, forty, and fifty—those children will be distinguished among their fellows. They do not want them to become indistinguishable elements in a crowd of people who look, think, and act alike.

This is not an either-or proposition of the sort that is dear to the hearts of the facile arguers about what is wrong with education. The wise parent wants his children to attain distinction on a firm foundation of common skills, standards, and attitudes that conform to the requirements of society. He expects them to use the language of their people effectively. He desires them to have command of mathematical processes, scientific information, and social graces. He trusts that they will learn and practice approved moral and religious principles. On that basis and within that framework, however, he knows that they will be different, and he hopes that they will be distinguished in their differences.

It seems plain that, what the best and wisest parent wants for his child, the community must want for all its children, as John Dewey said long ago. The more complex the society in which the community exists and the more difficult the problems it faces the greater are its needs for a wide variety of differences in the developed abilities of its people. A simple hunting and food-gathering community of savages may get along with the possession by all its members of a few simple, common skills. A modern democracy needs the utmost possible individual achievement from each of its citizens. That is why democracies—both modern and ancient—have always fostered the belief that every person is valuable in himself; that, as a unique personality, he has a unique contribution to make to the society of which he is a part; and that he has rights and privileges which no power can properly take from him. The smallest child (or, for that matter, an adult imbecile or even a criminal) has his individual rights, and a true democracy will defend him to the death in his exercise of them. In many quarters of the world, this is a strange and soft-seeming doctrine. It appears ridiculously Utopian and inefficient to supporters of authoritarian societies where men are faceless numbers in the state records, anonymous toilers in the state workshops, and voiceless weapons-carriers in the state armies.

But it is a familiar doctrine in every democracy—rugged in action, effective in results. From the beach at Marathon to the mountains of Korea, it has demonstrated in a thousand campaigns that individual free men are superior to massed slaves in battle, as in the factory, the field, and the market place. Its spirit, against the black backdrop of war, has never been more poignantly expressed than by the famous Edinburgh statue to the Highlands infantry. He seems to rest for a moment, that boy with the rifle. He is perhaps at the end of a forced march, waiting for the pipes to sound the *slogairn* for the charge. His head is raised as he looks toward the enemy. And then he says, "If it be Life that waits, I shall live forever unconquered; if Death, I shall die at last, strong in my pride and free."

Here is a little country, poverty-stricken in material resources—its total population less than half that of the city of New York, less than that of London by far, less even than that of Moscow—which has been sending its scientists, scholars, engineers, businessmen, bankers, shipbuilders, seamen, and farmers to play leading roles throughout the world, decade after decade (indeed, for more than two centuries). These Scotsmen succeed. They make great contributions wherever they go—not because of any mysterious national genius but rather because the Scottish people long ago decided that their boys would have to know more, do their jobs better, be more intelligent and hard-working individuals than the average run of men in the average run of country—countries like Germany, France, England, Australia, New Zealand, and the United States, among others. Scotland taught me long ago (as a student of comparative education) that, in the final play-off, it is not curriculum, methods, organization, or buildings in themselves that make a national school system. It is rather the national attitude toward the individual —toward his worth and dignity, toward his potentialities and capacities—that determines the quality of a country's schools.

Here in the United States today, we have the country that unquestionably ranks at the top of the nations which have undergone the first industrial revolution—the revolution by which men have substituted machines for muscle power. So successful have we Americans been in this regard that, although we have only 6 per cent of the world's population and certainly no more than 6 per cent of the world's material resources (considerably less than 6 per cent of some of the most important of those resources), we produce one-half the world's goods. Our piles of steel and fuel, cotton and corn, tobacco and motor vehicles, butter and bombs dwarf all other accumulations of material wealth from Pharaoh's granaries under Joseph's management to anything that Europe, Asia, and Africa combined can muster two and one-half millenniums after Pharaoh. These—and the great flood of other more or less valuable and significant articles that roll from our factories, farms, forests, mines, wells, and processing plants—make the United States today a technological giant towering over all competitors.

The United States is now entering another crucial period in its technological history, the second industrial revolution—that in which men substitute machines for brain power and, indeed, use machines which make decisions far more efficiently than unaided human minds can make them. Just as the first industrial revolution started as long ago as the day a savage first used a rock as a hammer or a stick as a lever in order to save muscle power (and thereby soon came to do things with tools that he could never have done with straight muscle power no matter how long he worked), so the second industrial revolution started when men first scratched symbols in the sand or on bark to aid their memories (and soon came to the place with the invention of writing where they could store away for later use masses of information that no human memory or aggregations of memory unaided by symbols could possibly have encompassed). Today, we are actually well into the second industrial revolution without being very aware of it. The lowly thermostat which saves us from having to watch the thermometer and turn the air-conditioner or furnace off and on has been in our houses a long time. The abacus, in use for centuries (and still so efficient a computing machine that, in the

hands of an expert, it can rival an ordinary electric calculator in speed and accuracy), is after all basically the same thing as the latest electronic computer except for the flat, arresting fact that the latter can do what a man cannot do—it can perform a computation in a matter of seconds that would take a whole team of mathematicians many hours to do.

We all use "thinking" machines. One that I have on an airplane makes decisions that I could not possibly make for myself. It is a stall-warning indicator. It takes into account the speed of the airplane, wind direction and velocity, and how much weight is being carried and where it is distributed. And, then, it blows a little horn when I slow the airplane down within five miles an hour of the speed at which, under all those conditions in combination at that time, the airplane will stall. If I had a panel of the most highly-skilled pilots in the air force sitting in that plane with me and pooling their judgments, they would not be as reliable and efficient as that little thinking machine (even presuming for the moment that they could work fast enough to make any decision as I am confronted with the choice of attempting to clear a mountain ridge or of turning and trying to get up more speed at that altitude).

Some of our good friends shrug this tremendous cultural revolution aside by saying, "A machine cannot do anything except what a man tells it to do." But that very true statement does not change the inescapable fact that, more and more, we are learning to tell the machine how to do things we cannot do ourselves. We have machines that run other machines, that supervise other machines, that plan new machines, and that make machines. With every step forward on this front, we need more and more men and women who are intelligent enough to envision what the machines can do and are skilled enough to tell them what to do.

The United States is not only technologically the most advanced country in the world. She is also—whether she likes it or not, whether she deserves it or not—politically the most important country in the world. She was born in the rattle of revolutionary gunfire. She proclaimed her independence from British rule in the noblest language of the eighteenth-century enlightenment. She took her first steps in the family of nations under the aegis of a constitution that remains unparalleled in its influence, strength, and flexibility. She came to political adolescence in the most shattering and meaningful civil war of the nineteenth century—a conflict involving the most significant of all political issues, that of individual human freedom. She moved into maturity by fighting again and again for liberty from imperial aggressors, totalitarian dictatorships, and ideological master-classes of whatever form and persuasion. From Breed's Hill and Saratoga, from Monmouth to Yorktown, from Gettysburg and Shiloh to Belleau Wood and the Argonne, from Anzio and Buffalo Head to Okinawa and the long, black corridor of Kuna-Ri, the Americans have marked in blood the high meaning of their passion for liberty.

Here also is the nation that could be, that should be, that must be morally a leader in the world. She has to be morally significant or her technical and political achievements will themselves at the end be meaningless—very probably dangerous to the Americans themselves and to all the world. Without moral power and direction, her material production can end only in a mountain of gadgets around which she may race at ever-increasing speeds with no goal in sight. Without moral

drive and orientation, her political power is likely to end in meaningless tyranny.

What do these three kinds of American leadership—the technological, the political, and the moral—involve in the way of education for American children? What does the present situation mean in terms of school policy?

It means first, it seems to me, that those who cry nostalgically for a return to an education they think was current in former days are deceiving themselves. With respect to instruction in technical subjects, for example, they shout that the Soviet Union is outstripping us and that not enough young people specialize in mathematics, science, and engineering; and then they pay practically no attention to the real issue—the teachers of these subjects. Teachers and prospective teachers of technical subjects are systematically bought away from the profession by the very same people who cry loudest about the lack of instruction in those subjects. We put them into the army, the navy, the air force, industry, commerce, everywhere except in the schools. We step up the pay in those areas readily, except for the schools. There we check every penny lest teachers lose the respectability that comes from educated poverty.

How can the United States possibly avoid exercising the great political leadership that history has thrust upon her? She could reduce the quantity and quality of instruction in the social studies, history, government, geography, sociology, and economics. She could elect men to legislative and executive offices for any reason except their knowledge of political and social realities and their devotion to political and social principles. She could forbid teachers in schools and colleges to discuss political and social issues; she could have most of the real teaching in this field done by political orators and the pundits of the mass media of communication. She could claim that she was unable to pay social studies teachers even as much as teachers of the technical subjects.

Most important of all is the question of how it would be possible for the United States to lose her opportunity for moral leadership. It could be done easily. All she would have to do is to reduce the quantity and the quality of the experiences whereby value systems are acquired by her people and particularly by her young people. For religion, she could substitute the latest craze or collection of crazes; for literature, the picture-tabloid; for drama, the soap-opera; for philosophy and psychology, the columnists' packaged advice. She could protest that the teaching of music, art, and the humanities, while all right in its limited ways, was not in the same category as a really serious subject like physics or vocational agriculture.

But let us leave this negative view of the matter. We Americans can and will meet the educational requirements put upon us by our great technological, political, and moral responsibilities. We will do it by studying our children more intensively and shrewdly than ever before to discover their strengths and weaknesses. We will develop their special abilities in all these fields to an extent unparalleled in the world's history, because we will give all our children a chance to develop their talents; we will encourage them to be different along every scientific, social, creative, and service channel we now need or believe we will need in the future.

We will try to educate our children to the mountain peaks of their unique capacities, and we will succeed. That is the way we will win on the technological, political, and moral fronts.

. . . interpenetrate various fields of knowledge . . .

The Impact of Automation on Education

WILLIAM L. MAXWELL*

THE WORD "automation" is so new that it is not yet in the dictionary. Yet in its short life it has been greatly misused, misinterpreted, maligned, and praised. "Automation" was coined by two men about the same time, each unaware of the other's interest. Neither of them had any idea that the word would be picked up and used as a battle cry by labor and capital, by radicals and dreamers, and by copy writers innumerable. The year was 1947. The men were D. S. Harder, a vice-president of the Ford Motor Company, and John Diebolt, a writer and consultant. Each was trying to find a simpler word than "automatization" which had been coined by Norbert Weiner, a professor at Massachusetts Institute of Technology.

The next edition of *Webster's New International Dictionary* will include this definition: "Automation: the act or technique of making a manufacturing process fully automatic. By this technique parts are moved in and out of machines without being handled by human operators."

There are literally dozens of different definitions of the word advanced by writers, editors, and business and labor leaders; some are rather long and involved. The definition advanced at the Electronics and Automation Production Conference which was held in San Francisco in August, 1955, has considerable appeal. "Automation is a tool which lightens labor, increases speed of production and lowers costs toward the end man may have more of this world's goods and a better life."

Automation goes one step farther than the automatic process. It can be illustrated by this example. You probably have an automatic washing machine in your home. You put in the clothes and soap, and you turn a dial. The automatic machine washes the clothes, rinses, spins out the excess water, and shuts itself off. An automated washing machine would do much more than that. You would put your entire washing in the hopper at one time and just press a button. The automated washing machine would sort the clothes by material and color. It would wash them in separate batches, adding just the right amount of soap and water of the right

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temperature for the material. It would wash each batch until it was clean and not a moment longer. It would rinse, dry, and sort the socks by size and color and even separate the "his" towels from the "hers" towels. And, if you had the super-deluxe model, it would iron the clothes and set them out in neat stacks. Of course, this automated washing machine might be almost as big as your kitchen. But the example is not too farfetched, because some of the automated factories now in operation perform processes more complex than these.

The concept of the fully-automatic factory is not new. In 1801, Joseph Marie Jacquard invented an automatic loom for weaving cloth which was controlled by a card with holes punched in it, much like the punched card used in the control of some machines in our modern automated factories. In 1784, Oliver Evans, a mechanical genius of his day, built an entirely-automatic flour mill on the bank of Red Clay Creek near Philadelphia. From the time the grain was scooped from the wagon until it came out as finished flour, no human hands were used to handle the product or control the process. World War II was the direct cause of the advances that brought automation. War demanded automatic fire control for aiming and firing guns and flight controls for controlling an airplane in flight—and the consequent developments in electronics. The computer is the heart (perhaps one should say the "brain") of these mechanisms.

The electronic computer had its earlier mechanical counterparts. The abacus is perhaps the oldest; its origin goes back to antiquity. In 1822, the English mathematician Charles Babbage proposed a "difference engine." He was one hundred years ahead of his time. The plan of the difference engine was well conceived, and the blueprints were a marvel of engineering and drafting ability. But the metal-working industry of that day was not far enough advanced to make the precise gears and other parts needed for his computer. After forty years of effort, Babbage was able to assemble a portion of his machine, but he was never able to complete it.

In 1930, Vannevar Bush of the Massachusetts Institute of Technology completed the first workable "differential analyzer." It was also mechanical in operation. Then came World War II and the electronic computer. After the war, the scientists reasoned that, if the computer, the servomechanism, and other electronic devices could be used to control the flight of airplanes and the firing of guns, they could be used to control the operations of machinery in a factory. And thus the automatic factory was born. The concept of machines being controlled by other machines, instead of by human beings, became a reality. The word automation seemed to fit this concept, and it stuck.

Automation, since it is only ten years old, is in its infancy. Let us see some of the things that are being done with automation today. At the automated Westinghouse factory in Columbus, Ohio, 2,600 machine tools stretched along twenty-seven miles of conveyors produce two refrigerators per minute—from raw material to the crated product—without the direct control of human hands. In the new, automated Raytheon plant, they can produce 1,000 radios a day with only two workers. Previously, the same amount of production required 200 workers. At the Corning Glass Works in Wellesboro, Pennsylvania, 90 per cent of all the electric light bulbs used in the United States and 100 per cent of all radio and television

bulbs (except picture tubes) are produced by fourteen machines, each with one operator. In their spare time, they make Christmas tree ornaments. At the new, completely-automated Plymouth V-8 engine plant in Detroit, the rated maximum capacity is 150 engines per hour—from raw material to the completely-assembled, tested, and crated engine. At the Rockford Ordnance Plant at Rockford, Illinois, 155 mm. shell casings are manufactured from raw steel billets by automated machinery from start to finish. The plant has one million square feet of floor space, yet it employs only 140 workers, including the engineers and maintenance men.

What effect has the inception of automation with its increased production and decrease in workers (in some plants) had on the labor picture as a whole? When the dial telephone (a form of automation) was introduced in the 1930's, there were predictions that the telephone operator would soon be as extinct as the dodo bird. In the ten years between 1940 and 1950, the total number of operators in the United States increased by 159,000. In the same ten years, the total number of office workers increased, in spite of the new office machines, from five to eight million. Television alone has created one-third of a million new jobs since its introduction. When the Admiral Corporation installed automated assembly machinery in its television factory, costs were reduced, the selling price of its product was lowered, sales increased, and (as an end result) it was necessary to employ more people. In 1921, the first year that the home refrigerator was put on the market, 5,000 refrigerators were sold at an average price of $530 each. In 1950, 6,200,000 refrigerators were sold at an average price of $258 each.

The period since the introduction of automation has been called the second industrial revolution. Automation is simply another development by man in his constant search for ways and means to increase his standard of living. Without it, we might still have the same standard of living which we had in 1940 when the per capita standard of living was $1,550. In 1955, it was $2,300. And, if the rate of advancement remains the same, it will be $3,900 in 1975. One curious aspect of this age of automation is that, as our standard of living is raised, the demand for workers increases. In 1940, one of every six workers in this country was unemployed. In 1955, we had sixty million employed out of an available sixty-four million workers. That is barely enough surplus to take care of voluntary quits and illnesses. In 1975, in order to continue the same rate of increase in the standard of living, we will have need for a work force of eighty-four million. Investigation of the population trend shows that in 1975 we may expect a work force equivalent to the number needed, with no surplus for contingencies. These figures, mind you, are based on a forty-hour work week. If we were to go to a universal thirty-two-hour work week, we would require an additional seventeen million workers. Since the results of automation so far have been to increase rather than decrease the demand for workers, there seems to be no basis for the assertion of the "off-the-cuff" economists that a shorter work week is imminent.

Let us see what a representative of big business thinks of the prospects in the next few years. Ralph J. Cordinier, president of General Electric, said,

> Our own company has 45,000 employees making products that didn't exist 15 years ago, and we have not hesitated to increase productivity by using better tools or a better process like automation.

We must be able to double our production in the next 10 years. We also know that the available work force will increase only 11% by 1964. How are we going to accomplish this increase in production? The answer is "automation."

There is no doubt that automation will create a change in labor requirements, but that change will be toward a greater demand on technical training and engineering education. The use of automated machinery will require a vast upgrading of labor. The existing work force of electricians, maintenance mechanics, machine operators, and engineers will require many months of schooling before they will be able to understand or service these new machines. This will place an additional load on the adult education program.

We have had a glimpse of what automation is doing in manufacturing; now let us see what the computers are doing for the business office. In March, 1955, International Business Machines unveiled the model 702 data-processing machine at the Monsanto Chemical Company's St. Louis headquarters. One man at the console of this giant brain, which extends in a sixty-foot arc in front of him, has at his command the computing ability of 25,000 trained mathematicians. At that time, IBM had delivered 19 of the computers and had orders for 129 more.

The role of the computer in automation may not be apparent at first if we think only of the giant computers such as the model 702. The computer used in flight control on an airplane may be only as big as your fist. The computer used in the control of a contour mill might fit into a cabinet the size of a gymnasium locker. But, whatever their size or special adaptation, they have one thing in common: they are data-processing machines. The large computers have received most of the public attention because the things they do are spectacular and awe-inspiring. For example, one of the problems solved by the IBM model 701 in 1953 was the Thomas-Fermi-Dirac equation. This equation can easily be written on a piece of paper 4 inches square. But here, as reported by IBM, is the estimated time it would take to do the computation if performed on the various tools at the command of the mathematician: pencil and paper—800 years; desk calculator—4,000 weeks; automatic sequence controlled calculator (an earlier computer built in 1948)—80 hours; model 701—2 hours. Preparation of the problem before putting it into the computer would require the services of the mathematician and an assistant for about five weeks.

Another computer of interesting proportions is ERMA (electronic recording machine, accounting) which is being installed at the San Jose branch of the Bank of America. ERMA can handle all the bookkeeping functions for 32,000 accounts: withdrawals, deposits, bad checks, monthly service charges, and printing the individual bank statements at the end of the month. ERMA contains one million feet of wiring, 34,000 diodes, and 8,000 vacuum tubes; and it weighs twenty-five tons. ERMA has to have its own air-conditioning system because, in doing its chores, it generates enough heat to warm three eight-room houses. The next ERMA will be able to handle 50,000 accounts. Bank of America needs thirty-seven ERMAs in its various branches.

A partial list of computers in use will give some idea of what has been done in this field. The Whirlwind at MIT can add a column of numbers sixteen digits wide and as high as a forty-story building in one second. The Reservisor, reserva-

tion computer for American Airlines System at La Guardia Field, stores reservation information for ten days ahead on a magnetic memory drum. By use of the automatic message accounting system of the Bell Telephone Company, long-distance calls are automatically timed, rated, and (at the end of the month) the charges are computed and the individual's bill printed. The Ace is an automatic computing machine at the National Physical Laboratory in England. Since the English are a logical-minded people, the second machine made was called the Deuce. The Binac (electronic binary automatic computer) at Northrup Aircraft in Hawthorne, California adds or subtracts at the rate of 3,500 computations per second; multiplies or divides at the rate of 1,000 per second. The machine is actually a pair, each of which checks on every operation of the other for errors. It is 5 feet high, 4 feet long, and 1 foot wide. The Nimrod is a computer built to play the game of nim at the Festival of Britain. It played against all comers and always won. Nim is a sort of tick tack toe. The Univac was built by the Remington Rand Corporation. One of them now installed at the Pacific Mutual Life Insurance Company in Los Angeles takes care of 350,000 ordinary life accounts. The Metropolitan Life Insurance Company computer works only sixty hours a week, yet it does 7,000 daily premium billings, 20,000 monthly dividend calculations, and 130,000 monthly agency commission calculations. It replaced 200 office workers.

Just in case you find the recital of the accomplishment of these computers a little overwhelming, let me hasten to assure you that we do not as yet have to apologize for the capacity of the human brain. The human brain has some ten billion cells, each brain having approximately five times as many cells as there are human beings on this earth. Of course, the educators tell us that a good many of these brain cells are never used. One unsung champion of the human race has figured out that, cell for cell, the largest giant brain made has an intelligence of about the order of the earthworm.

The things a large computer can do are these. It can (1) learn what you tell it; (2) apply the instructions when needed; (3) read and remember numbers; (4) add, subtract, multiply, divide, and round-off; (5) look up numbers in tables; (6) look at a result and make a choice; (7) do a long chain of these operations, one after another; (8) write out an answer; (9) make sure the answer is right; (10) know that one problem is finished and turn to another; (11) determine most of its own instructions; and (12) work unattended.

The things a computer cannot do are these. It cannot (1) do intuitive thinking; (2) make bright guesses and leap to conclusions; (3) determine all its own instructions; and (4) perceive complex situations outside itself and interpret them.

In addition to the present uses of problem-solving and control of machine operations, computers will undoubtedly be used for such purposes as these. (1) Library reference work. From its magnetic memory, a computer could swiftly tabulate or show on a screen where the information could be found. This would also apply to patent searching. (2) Translating. The major publications of all countries could be quickly translated into any other language. Thus, within days, the technical writings of one country would be available in any language. (3) Psychological analysis—aptitudes, intelligence quotients, and personality testing. The subjects unspoken, mental responses to pictures on a screen or written or verbal questions

could be analyzed and a written report made in a matter of minutes—all done by the computer. (4) Psychological training. This might take a little longer to develop, but the knowledge which now enters the brain through the five senses could perhaps be fed directly to the brain from the computer through the medium of stimuli generated by the computer.

The few illustrations I have given here should be sufficient to show that great strides have been made in the past twenty years in the development of data-processing machines and in the application of those machines to the control of manufacturing processes, to communications, to the solution of mathematical problems, and to large-scale accounting. The major obstacle confronting industry and science at the moment is the lack of young blood to carry on the present advances and assist in future development. We have need for 40,000 new engineers each year. In 1954, only 22,300 engineers received their degrees and, in 1955, only 19,650—an average of just one-half of our requirements.

Leaders in the fields of education and business are very much aware of the growing deficit in the supply of engineers needed for this new world of automation. Ernest O. Lawrence of the University of California at Berkeley, in his report at the International Conference on the Uses of Atomic Energy, tells of talking to Alexander Topchiev, general scientific secretary of the Academy of Sciences of the Union of Soviet Socialist Republics. He was told that "250,000 freshman college students each year begin majors in mathematics, physics, chemistry, or biology. This group of 250,000 was selected from two and one-half million applicants." And Dr. Lawrence made this comment. "In contrast to this, in the United States we are not training as many students in science today as we were a few years ago, while the demand for scientists is enormously greater."

At the Western Computer Conference held in February, 1953, Lee A. Du Bridge, president of California Institute of Technology, said,

> For the long term we must attract more able young men and women at high school level into the scientific and engineering fields. This can be done by: (1) better counseling at the high school level; (2) provide further information on opportunities in engineering to high school students; (3) increase salary scales in science and engineering; (4) increase the prestige of the scientist.

At the same conference, Simon Ramo, now of Ramo Woolridge Corporation, said, "Ultimately the universities must turn out a new kind of doctor whose studies include the physical sciences, with emphasis on electronics, a study of the human brain, methods and procedures in business and industry, and government and labor rules and regulations."

Ernest V. Hollis, chief of college administration of the United States Office of Education, in a speech delivered at the commencement exercises of the University of Nevada in June, 1955, stressed the job needs of automation. He listed them as machine-builders, installers, controllers, repairers, designers, chemists, engineers, physicists, mathematicians, and logicians.

Each year, fewer high-school and college students are taking the courses which would help fit them for the jobs in automation. There is certainly no lack of intelligence in the young people of this country. Then why do only one-fourth of the state-college entrants in California graduate? Why do only 25 per cent of the high school students in the United States take algebra, as opposed to 56 per cent

in 1900; only 5.8 per cent enroll in physics compared to 22.8 per cent in 1898? The obvious and easy way out is to place the blame on the educators, to accuse them of not making algebra, physics, and chemistry "attractive" enough. I assure you that a problem in trigonometry can be just as tedious to an engineer at his desk, or to a machinist in the shop, as it is to the student who has taken the problem from a book.

If the educator is to be held responsible for the student's entire choice of subjects and consequently his later career, then I submit that the role of the educator must be redefined. The scope of the field of education must be made sufficiently broad to include a Department of Motivation. This department would be charged with the psychological analysis of each student in high school and college. It would take the initiative in motivating the student to study for the career for which his aptitudes show him to be best fitted. Since most people show aptitudes in more than one field, it would place emphasis on those occupations where there is the greatest demand. I am referring to a much more intense approach to the subject than the type of guidance carried on in the high schools today with the limited funds and personnel at its command. The problem is very difficult. The program to solve the problem would have to be very extensive.

The responsibility for supplying the demands of industry and science with the necessary number of trained, graduate students is being placed on the shoulders of the educators by businessmen and editors. With that responsibility must go commensurate authority. Whether we say that we are to motivate a student to study for a particular profession or sell him on the idea of studying for that profession, or to slip him algebra and physics compulsorily in some sugar-coated form, the first problem is one of money and trained personnel. Maybe the editors who inveigh against the educators can first help solve that problem. Educational work is a dedicated profession. Educators have never shirked their responsibilities. Perhaps the businessman who expects the schools to supply his demands for engineers is shirking his responsibilities. When we see the day that businessmen as a whole provide an effective liaison between themselves and the schools, not just in Washington but in every community, then we will have begun to approach the solution to this problem.

To sum up briefly: The advances in automation have brought interesting, sometimes astonishing, results in manufacturing and data-processing. While automation is helping to increase the standard of living, it is creating a greater demand for manpower—particularly engineers. The supply of technically-trained college graduates must be greatly increased. Training must begin at the high-school level but the acceptance of such training requires properly-motivated students. The motivation and guidance of our youth to particular careers is an almost untouched aspect of the field of education. The educators can meet these increased demands—given the necessary funds and trained personnel.

. . . to further the cause of democratic education . . .

Education in Liberia

MARY ANTOINETTE BROWN*

BEFORE COMMENTING on education in Liberia, I shall give a few basic facts about the country in order that the educational situation might be viewed in perspective. Liberia is an independent Negro republic situated on the west coast of Africa between French and British colonial territories. The country is small in size (with an area of 43,000 square miles) and has a correspondingly small population (estimated to be 2,500,000). Although English is the official language, about twenty-eight dialects are spoken within the republic. Liberia was settled in 1822 by a group of Negroes who emigrated from the United States under the auspices of the privately-organized American Colonization Society. These settlers landed on Providence Island and negotiated for land with the African chiefs—representatives of various tribal groups—who ceded it on the strength of the settlers' promise to build a nation for all of them and their descendants. Liberia—the result of the interaction between Western emigrants and African tribesmen and their respective cultures—has to her credit an unbroken record of independence.

Formal education began in Liberia shortly after the landing of the settlers in 1822. The first record of a school was the elementary day-school opened in the same year by the Providence Baptist Mission for the children of its church members. Other missionary groups followed this lead, with the result that education, during the early years of the nation and even up to the turn of the century, was largely in the hands of the various missionary groups. Stress was laid not only on the three R's but also on the fourth R, religion, because religious leaders of each faith recognized that an effective job of proselyting could not be done if some elementary educational training was not provided the children of the members of that particular faith. Unfortunately, American educational patterns were adopted without proper analysis of the existing situation and proper modification of these patterns, thus making education for the most part unrelated to local needs. At the time, educational efforts were centered mainly in the seacoast settlements and in the hinterland areas immediately back of the seacoast. Schools were sometimes established without adequate funds for financing them. Standards varied considerably. Out of this situation, a definite need grew for charting an educational course for the nation. Education designed to meet the nation's needs (and of ac-

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ceptable quality) had to be made available to people *throughout* the country. Governmental action—centralization in education—became necessary.

Education in Liberia is highly centralized. Attempts at effective centralization began in 1900. During that year, educational activities within the country were co-ordinated by the establishment of a Bureau of Education. This bureau, raised to cabinet status in 1912, is now known as the Department of Public Instruction. It is headed by a Secretary of Public Instruction who is responsible for the oversight of all schools and of educational institutions and activities in the republic. He is aided in his work by two undersecretaries, an assistant secretary, and supervising teachers stationed in each of the country's five counties and three provinces. Such duties as supervision of all schools, checking on the enforcement of school laws, issuing rules and regulations for the effective operation of schools, setting requirements for curricular offerings, specifying the length of the school year, and licensing or certifying teachers constitute major functions of the Department of Public Instruction. Examinations to be given all over the country to persons completing terminal points in the school system have not yet been devised. But the department is giving consideration to the development of these examinations in the near future for the purpose of obtaining uniformity in the nation's educational standards.

Unfortunately, there exist within the country many handicaps to effective centralization. Among these are inadequate communication and transportation facilities, insufficient properly-trained supervisory personnel, and lack of adequate finances. The department hopes gradually to surmount these difficulties, as the government has recently developed a program with emphasis on building road networks and extending communication facilities, on increasing in-service training of present supervisory personnel and selecting new supervisors by means of more rigid standards, and on increasing the national revenue to make practicable the appropriation of larger amounts of money for educational purposes.

Practically all education in Liberia is *public*. In a strict sense, there are only a few *private* schools, for subsidies are made by the government to a substantial number of the schools in the country which are maintained by religious groups, by independent agencies, and by private individuals. This is necessary to facilitate the governmental control of schools and to provide supplementary funds to add to those which often would otherwise be inadequate for defraying operational costs of schools.

By law, education is compulsory for children between the ages of six and sixteen. Despite this fact, slightly more than 10 per cent of the estimated school-age population of the country is in school. The government is unable to enforce this law because there are presently insufficient schools to accommodate all children of school age and too small a supply of teachers to staff the quantity of schools the nation needs. The result is that inequalities in educational opportunities exist, with regional factors largely responsible. The average rural child has far less educational opportunity than the average urban child. In order to remedy this situation, the government plans an expansive educational program in rural areas with a goal of 220 schools to be built by 1960. (Some financial and technical assistance for this project is to be furnished by the United States International Co-operation

Administration.) Two hundred of these are to be village schools which will provide training through grade four. Each of twenty central schools will include grades five through eight and will draw students from the various village schools in its area. The plan is based on an experimental project in Saniquellie District, far in the interior of the country. There is a village school in each of ten villages on the outskirts of Saniquellie. From these schools, the central school in Saniquellie draws its students. This rural education plan is the first scientific attempt at school districting. It is doubtless based on the fact that many villages in the interior of the country are so thinly populated that providing for complete elementary education in each would be too expensive. It represents a new idea in the sphere of elementary education in the country because it provides for grade four to be a terminal point in some schools. According to the present educational structure, which operates on the 8-4-4 plan, elementary schools provide training through grade eight. How valuable the new 4-4-4-4 plan will be in these areas will depend to a large extent upon curricular offerings in the village schools covering the lower elementary level.

The question of curricular offerings is extremely important because the holding power of Liberian schools has been low and curricular inadequacies one of the probable explanatory factors. Some preliminary investigations have shown that there is considerable pupil drop-out in the elementary school, the lower elementary level not excluded. Conscious efforts recently have been made to rectify this situation, although there are schools which have not been favorably affected. The Elementary School Course of Study prepared in 1953 by the Department of Public Instruction provides for more flexible and more enriched offerings in the elementary schools. In the high schools, vocational training is beginning to receive some emphasis—impetus for this coming, no doubt, from the government's pilot, vocational-education program at Booker Washington Institute in the Central Province. On the collegiate level, within the last few years, a departure has been made from a curriculum based strictly on the classical tradition and concept of 'mental discipline. The natural sciences (which stood out prominently among neglected areas of study on this level) are receiving new emphasis, some assistance in this direction being furnished by UNESCO specialists working in the country. Collegiate course offerings are becoming broader and more varied.

Liberia's educational structure is a single-ladder system. Children finishing elementary school are eligible to attend any high school in the republic. Similarly, there are no types of high schools which exclude a student from higher academic pursuits. As long as a student completes study at one of the twenty high schools in the country (whether a school with a strictly college-preparatory curriculum or one with a technical curriculum geared to vocational needs), he is eligible for entrance into any of the nation's institutions of higher learning. The democracy in educational opportunity which the single-ladder system affords will be felt in Liberia in increasing degree as more children of school age attend school. Moreover, there will be no danger of this system providing Liberia with more professional men and women than its society can support until a large percentage of the school population begins to attend college. For the year 1956, only about 1 per cent of the nation's nearly fifty thousand school children attended colleges within

the country.

One of the major problems in Liberian education is the acute teacher shortage. Although all three institutions of higher learning in the republic have programs for training teachers, the total yearly output of these schools falls far short of the number necessary to meet the needs of the rapidly expanding school population. Increase in the nation's birth rate is likely to make the demand for elementary school teachers even greater in the near future. Considerations are, therefore, being given now to establishing teacher-training programs below the collegiate level.

Concomitant with this problem is the need for upgrading the present teaching force, many members of which have had inadequate training for holding teaching positions. Most persons falling into this category were drawn into the field years ago when teaching was not recognized in Liberia as a highly skilled and complex activity. But the urgent need for a teaching force much larger than the present one makes it impractical to drop them at the present time. The government is, therefore, giving special attention to its in-service programs for upgrading teachers—vacation schools and extension schools. For four weeks yearly, vacation schools are conducted at important educational centers in each of the five counties and three provinces. Practically all teachers within the republic attend. Those who have had collegiate training serve as lecturers and instructors, while the others study in classes prescribed according to their qualifications. During 1956, the Division of Guidance and Testing of the Department of Public Instruction (by means of checking the credentials of teachers and administering tests to them), for the first time, classified teachers throughout the country according to actual school grades extending from elementary school through college. The 1957 vacation schools opening for work in early January will organize classes on the basis of this classification scheme and should, therefore, be more effective than preceding ones. Realizing, however, that upgrading by means of vacation schools is a rather slow process, the government has established, since 1955, extension schools at points in each of the five counties and three provinces. During the regular school year—early February through late November—teachers needing additional training are urged and given every encouragement to attend classes held during the evenings to give them the opportunity to study and improve themselves.

Meanwhile, the Department of Public Instruction is completing the final details of its new plan for certification of supervisors, principals, and teachers in the republic. Under this plan, emergency certificates will be given temporarily to persons in the service who do not have the desired educational qualifications. Should these persons fail to make significant improvement in their scholastic achievement and classroom performance by a time which the department will specify, they will be dropped from the service.

Another factor which should contribute toward raising the level of the teaching force in the country is the salary schedule and the teacher retirement and teacher tenure proposal for elementary and secondary government school teachers passed into law by the legislature during its 1955-56 session. This schedule provides, among other things, for a salary to be paid in relation to competence—academic achievement and professional experience—and for equivalent salaries to be paid teachers as are paid workers in occupations requiring comparable professional

training. As soon as it is implemented, it should provide incentives for persons already in the field and should attract more individuals of high caliber into the profession.

Co-operating with the government in its endeavor to improve education on all levels and to reduce illiteracy in the country are various missionary groups (which help maintain one-fourth of the nation's total number of schools) and a few independent agencies. Some technical and financial assistance is being furnished by the United States International Co-operation Administration and UNESCO.

Much still has to be done to narrow the gap between educational ideals and practices in Liberia, but the rapid strides made in educational development within the last ten years point to a bright future for education in the country.

ADDRESS CHANGES

Remailing of undelivered *Educational Horizons* is no longer possible, due to a change in postal regulations. The national office staff will continue to try to trace addresses of members whose journals cannot be delivered because they failed to notify the office that they were moving. No address changes are made unless members themselves notify the office to do so. The appearance of a new address for a member on a chapter dues list cannot be considered authority to change an address. Therefore, to insure receiving *Educational Horizons* without interruption, it is each member's responsibility to inform the national office PROMPTLY of any change of address. Please indicate the former as well as the new address.

. . . professional preparation . . .

The Recruitment of Teachers

RUTH E. ECKERT*

QUALIFIED teachers are the prime need today in our schools and colleges. While buildings and equipment must be vastly expanded, the strength of the educational program will be determined chiefly by the size and caliber of the professional staff. And, upon the success of the teaching done in our schools, will depend America's ability to meet critical lacks and shortages in every other area of our national life. As the Educational Policies Commission recently commented, "The shortage of essential teachers is the most significant and specific educational implication of the manpower situation in the United States for the 1950's and 1960's."[1]

Even now, the need for teachers far outstrips the supply, and this gap is widening perilously. From children of the depression years (representing the smallest birth rate group in the nation's history) must come most of the new teachers required to staff an unparalleled expansion in school and college enrollments—from twenty-eight million just after World War II to forty-one million in 1955-56 and to a predicted fifty-one million by 1964-65. More education for more American youth has become a necessity, not only to preserve our heritage but to ensure our survival in this uneasy world. And no substitute has ever been found in this process for the personal relationship of teacher and student. Whereas 125,000–150,000 new elementary and secondary teachers will be needed annually for at least the next ten years, the annual production now stands at only 90,000 a year, a third of whom do not take positions the following fall.[2] In addition, some 20,000–25,000 new college teachers must be found each year, which is several times the number currently produced.

But the current need for teachers is not one of numbers alone, but also of quality. Promising candidates must be vigorously recruited to enter teaching careers; others must be screened out through valid selective procedures. Fortunately, one factor need not be sacrificed to secure the other. Thus, the states that have set adequate requirements for their teachers are not experiencing the acute shortages faced in those with depressed standards. Selective recruitment serves, in other words, to increase the supply of qualified teachers, assuring the schools not only

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[1] *Manpower and Education*. Washington, D.C.: Educational Policies Commission, 1956, 109.

[2] *The Crucial Years*. Washington, D.C.: National Commission on Teacher Education and Professional Standards, 1955, 1.

of *better* teachers but of *more* teachers.

While there is certainly no panacea for the problem of how the critical shortage of teachers can be met, a number of significant steps can be taken toward solution. Casual methods of recruitment can be replaced, as is already being done in some parts of the country, by clearly-defined programs in which educators and lay citizens play their appropriate roles. Similarly, superficial or temporary remedies, such as the emergency certification of substandard teachers, can be rejected in favor of educationally-sound solutions. An effectively-organized, nationwide effort to attract hundreds of thousands of able youth into teaching careers offers the best hope of meeting the problem, as is witnessed by the encouraging upswing in teacher-education enrollments these past two years. Assuming that the persons so recruited are provided with the proper encouragement, scholarship aid, and training required to develop their full teaching potential, these young people will become the vital energy-core of our future school and college programs.

Many other persons who can serve usefully must also be enlisted, with every available category of resource imaginatively tapped. Among groups with such unrealized potential are married women and other older college graduates who are not now fully absorbed in the labor force, teachers who are fully competent to serve beyond the usual retirement ages, and qualified persons from minority groups. Even part-time teachers from other professions, business, and industry may need to be used in special programs, as well as those from early-retirement groups from these and other fields. The nation's pool of talented teachers may also be increased in other ways. Upward adjustments in salaries, improved work conditions, and greater social and professional recognition will help to keep experienced teachers in our schools and colleges. So, too, will their release from routine tasks which tend to sap teachers' energies from their real job of instruction. Television, motion pictures, and other learning aids are likewise helping to broaden the superior teacher's scope of operations, resulting in a much better utilization of his abilities.

The individual teacher who performs his tasks intelligently and is clearly proud to be a teacher gives the strongest possible recommendation for this career. College faculties, state departments of education, and professional associations must also continue to take active leadership in solving the problem of the teacher shortage. But this responsibility does not rest with teachers alone—it is a problem for the full citizenship of the nation. There are many steps that must be taken, and the time to take them is now. Children constitute the nation's most precious resource. They cannot wait to be educated.

. . . encouraging graduate work . . .

American Doctoral Dissertations on Education Written by Women in the Nineteenth Century

WALTER CROSBY EELLS*

THE FIRST DOCTORATES of philosophy earned in an American university were conferred on three men at Yale University in 1861. The first doctorate earned by a woman was conferred by Boston University in 1877. Since 1861, as shown by tables prepared by the writer for the current edition of *American Universities and Colleges* (Washington: American Council on Education, 1956, seventh edition, pp. 65-80), more than 130,000 doctorates have been conferred in the United States, over 15,000 of them on women.

Records regarding these women, particularly prior to 1901, are very incomplete and inaccurate in the published reports of the United States Commissioner of Education. Considerable information concerning 228 of them who earned their doctorates during the nineteenth century is given in an article by the writer in the Winter, 1956, issue of the *Bulletin* of the American Association of University Professors. This information includes names, institutions, dates, and major fields of study for these 228 women who thus were pioneers in the field of advanced scholarship in the United States.

Through a search of the early catalogs and other institutional publications in the library of the United States Office of Education and through correspondence with the librarians, archivists, and alumni secretaries of the institutions concerned, the writer has been able to secure also the dissertation subjects for more than nine-tenths of these women. There was not space, however, to list all of these dissertations and other information concerning their authors in the *Bulletin* article referred to above. Information regarding the publication of more than one-half of these dissertations (and, in many cases, dates of birth and death of the authors) have been found in the Library of Congress and elsewhere.

Of the entire group of 228 known nineteenth-century women doctors, at least 26 wrote dissertations in the field of education. Only nine of these, however, se-

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cured the degree of doctor of philosophy; the other seventeen were awarded the degree of doctor of pedagogy, analogous to the modern degree of doctor of education. All of the degrees of doctor of pedagogy were conferred by New York University. A chair of pedagogy was first established in 1886 at New York University, then known as the University of the City of New York. In 1888, graduate instruction in education was opened to women, the first coeducational program of study in the university. In 1890, the University Council established the School of Pedagogy with authority to recommend candidates for the degrees of doctor of pedagogy and master of pedagogy. At the same time, a candidate for the doctor of philosophy in the graduate division of the university could elect pedagogy as his major field. From 1890-91 to 1920-21, students were prepared in the School of Pedagogy for the degree of doctor of pedagogy with a dissertation as one of the requirements. In 1920-21, the name was changed to the School of Education, and the school was authorized to prepare for the doctor of philosophy degree. Beginning in 1934-35, the School of Education also offered the degree of doctor of education.

Of the group of twenty-six doctorates in education earned by women in the nineteenth century, seventeen were conferred by New York University, all but one being the doctorate of pedagogy. Two women earned the doctor of philosophy degree in education at the University of Chicago, and one each at the University of California, Columbia University, the University of Minnesota, the University of Pennsylvania, the University of Wooster (now College of Wooster), and Yale University. The earliest dissertations of the group were written in 1891, two at New York University and one at the University of Wooster. One or more were accepted every year from 1891 to 1900, the largest number being four in 1892 and again in 1897.

The names of the twenty-six women who secured doctor's degrees in education (with subsequent married name, if any), institution and year of their bachelor's degree, institution and year of their doctor's degree, and birth and death dates (as far as these data have been found) are given below. These facts are followed by the titles of their doctoral dissertations and all available information concerning publication of them. Publication data have been found for almost one-third of these early dissertations.

This historical information concerning early women scholars and their original contributions in the field of education may be of some interest to those engaged today in the teaching of education and in the direction of educational research in American universities and colleges.

ELIZABETH DANCY BATTLE, -1900. Ped.D., New York University, 1899. Dissertation: "Manual Training as Related to Girls."

ISOBEL CAMP, -1933. (Ped.M., New York, 1892). Ped.D., New York University, 1893. Dissertation: "Teaching City Government in City Schools." 51 pp. MS.

HANNAH BELLE CLARK, 1864- . (A.B., Smith, 1887). Ph.D., University of Chicago, 1897. (Mrs. Ambrose V. Powell). Dissertation: "The Public Schools of Chicago: a Sociological Study." Publication: Chicago: University of Chicago Press, 1897. 117 pp.

ELSIE WORTHINGTON CLEWS, 1875- . (A.B., Columbia, Barnard, 1896). Ph.D., Columbia University, Barnard College, 1899. (Mrs. Herbert Parsons). Dissertation: "Educational Legislation and Administration of the Colonial Governments." Publication: New York: Macmillan Co., 1899. IX, 524 pp. (Columbia University, Contributions to Philosophy, Psychology, and Education, Vol. VI, No. 1-4, May, 1899).

MARY ELIZABETH COFFIN. (Ped.M., New York, 1894). Ped.D., New York University, 1896. Dissertation: "Apparently in the early days of the School of Pedagogy at New York University, the dissertation was required but filing a copy in the library was optional. We know that the Misses Coffin, Hicks, and Wheeler were granted Ped.D. degrees in the years you have indicated, but there is no record of the library ever having had a copy or of what the subjects of the dissertations were."—Letter from Anne L. Corbitt, Ref. Librarian, July 11, 1956.

EMILY IDA CONANT. Ped.D., New York University, 1891. Dissertation: "The Relation of Psychology to Pedagogy." 20 pp. MS.

JANE CONNELL. Ped.D., New York University, 1898. (Mrs. F. O. Hellier). Dissertation: "A Study of Children's Interests in Fairy Tales." 52 pp. MS.

Mrs. ELIZABETH M. CROSS, -1937. Ph.D., University of Wooster (now College of Wooster), 1891. Dissertation: "The Education Which Our Government Should Give." Publication: *Postgraduate and Wooster Quarterly,* January, 1892.

HANNAH W. DE MILT. Ped.D., New York University, 1895. Dissertation: "Economic Value of Gesture in Teaching." 23 pp. MS.

MARY B. DENNIS. (B.S., Daughters College, called Young Ladies College 1892-93, now defunct, 1881). Ph.D., New York University, 1892. (Mrs. Addison B. Poland). Dissertation: "Science Teaching in the Elementary Schools."

GERTRUDE MARGUERITE EDMUND, -1922. Ped.D., New York University, 1892. Dissertation: "A Course of Study Arranged according to the Accepted Principles of the Science of Method, Principles of Psychology, History of Education, and the Experience of Our Times." (*Note:* Miss Edmund also secured a Ph.D. degree from New York University in 1919 with a dissertation entitled: "The Higher Education of Women in the United States Up to 1870.")

MARY GRAHAM. (Ph.B., Wesleyan, 1889). Ph.D., Yale University, 1895. Dissertation: "The Relation between Education and Poverty."

LOIS MARGARET HICKS. Ped.D., New York University, 1897. Dissertation: See note from reference librarian under Mary Coffin, above.

HARRIET E. HUNT. Ped.D., New York University, 1891. Dissertation: "The Dominant Seventh in Education." 22 pp. MS.

ELLEN E. KENYON. (Ped.M., New York, 1891). Ped.D., New York University, 1892. (Mrs. Worner). Dissertation: "The Common School Curriculum of the Future." 16 pp. MS.

SARAH MARION MacDOUGALL LENHER. (Ped.M., New York, 1897). Ped.D., New York University, 1900. Dissertation: "Method and Material for Teaching History for the Seventh Year Grade." 322 pp. MS.

ROSE M. LOTHROP. Ped.D., New York University, 1897. Dissertation: "Physiological and Psychological Tests in the Training School." 83 pp. MS.

JENNY BIGGS MERRILL, 1854-1934. Ped.D., New York University, 1892. Dissertation: "A Plea for the Pure Kindergarten." 24 pp. MS.

KATHLEEN CARTER MOORE. Ph.D., University of Pennsylvania, 1896. (Mrs. John Percy Moore). Dissertation: "The Mental Development of a Child." Publication: New York and London: Macmillan Co., 1896. III, 150 pp. (*The Psychological Review:* Monograph Supplement, No. 3, October, 1896).

ALICE J. MOTT, -1924. (B.L., Iowa College, now Grinnell College). Ph.D., University of Minnesota, 1899. Dissertation: "The Ninth Year of a Deaf Child's Life." Publication: Fairbault, Minnesota: Press of the Fairbault Republican, 1900. 107 pp.

HANNAH W. NEWMANN. Ped.D., New York University, 1894. Dissertation: "Reflex Action and the Meaning for Will Development." 54 pp. MS.

CHARLOTTE MAY PINK. Ped.D., New York University, 1896. Dissertation: "Comparative Strength of Children's Associations." 29 pp. MS.

LIZZIE ELIZA RECTOR, 1866-1955. Ped.D., New York University, 1895. Dissertation: "Montaigne." Publication: Published as *Montaigne: The Education of Children. Selected, Translated, and Annotated by L. E. Rector, Ph.D.* New York: D. Appleton & Co. 1899. XXIII, 191 pp. (International Education Series. With editor's preface by W. T. Harris, Washington, D.C., June 10, 1899).

MILLICENT WASHBURN SHINN, 1858-1940. (A.B., California, 1880). Ph.D., University of California, 1898. Dissertation: "A Study of the Development of Sense Activity in the First Three Years of Childhood, with Pedagogic Conclusions." Publication: (1) *Notes on the Development of a Child,* Berkeley, California: University of California, 1893-99. Vol. IV, 424 pp. (University of California Publication, Education, Vol. I. University of California Studies). (2) *Notes on the Development of a Child. II. The Development of the Senses in the First Three Years of Childhood.* Berkeley, California: University of California Press, 1907. 258 pp. (University of California Publication, Education, Vol. IV). "Continuation of and may be considered volume two of the author's *Notes on the Development of a Child, 1893-1899.*" (3) *Notes on the Development of a Child.* Berkeley, California: University of California Press, 1909. Vol. IV, 424 pp. (University of California Publications in Education, Vol. X). "First published in three parts (four numbers) 1893-1899." (4) Evidently the basis in part also for the author's *The Biography of a Baby,* Boston and New York: Houghton, Mifflin & Co., 1900. 247 pp.

MIRIAM ELIZABETH WHEELER. (Ped.M., New York, 1895). Ped.D., New York University, 1897. Dissertation: See note from reference librarian under Mary Coffin, above.

ELLA FLAGG YOUNG, 1845-1918. (Graduate, Chicago Normal College). Ph.D., University of Chicago, 1900. (Mrs. William Young). Dissertation: "Isolation in the School." Publication: (1) *Isolation in the School,* by Ella Flagg Young. Chicago: University of Chicago Press, 1900. 57 pp. (2) Same title, by Ella Flagg Young, professor of education. Chicago: University of Chicago Press, 1901. 111 pp. (Contribution to Education, No. 1). (3) Same title, by Ella Flagg Young, sometime professor of education in the University of Chicago; principal, Chicago Normal School. Chicago: University of Chicago Press, 1906. 111 pp.

. . . stimulating research . . .

Elementary School Teachers at Work

(Part 2)

RUTH LOFGREN*

AN ACTION-RESEARCH program developed around the unique problems of our particular classroom or school will provide far more satisfactory solutions than the day-to-day expedients we so often use. One needs no special training to begin such a program. As the great inventor, C. F. Kettering, says, "Research is a friendly, welcoming attitude toward change." Perhaps it will give us ideas to see how others have approached their school problems and what benefits have derived from an organized project.

This is the second in a series of reports on the development of an actual action-research program on teaching the gifted child in the regular classroom which is now in progress in an elementary school. A summary of the first report follows. Although the germ of the idea was planted ten years ago, each teacher continued to meet the challenges of bright students in his own way. Then, two years ago during a curriculum evaluation meeting, one of the teachers suggested that the gifted child be studied. Several others were enthusiastic about the project, and it was organized with the principal acting as co-ordinator.

The present report deals with the specific details of the program. The members of the faculty differentiated their project into three phases: (1) identification of the gifted children in the school, (2) definition of "gifted," and (3) curriculum development. The first two phases were so closely interrelated that they were begun simultaneously. A small lending library was assembled. The books were carefully selected by the school psychologist and others, in an attempt to provide sources for a thorough understanding of the gifted child. The faculty members shared their growing insights in informal discussions. An authority who has done outstanding research on the education of gifted children was invited to the school. During his two seminars, many of the basic issues of the program were brought sharply into focus. The specialist stressed the importance of motivation and the major role played by cultural attitudes in determining which talents are developed. He reminded the group that today athletes are respected, scholars are not. In such a climate, the gifted child may feel somewhat of an outcast if he is too "bright."

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* RUTH LOFGREN is a faculty member of Brooklyn College and the Child Education Foundation and research associate, Foundation for Integrated Education.

To motivate a child to do his best against this social pressure may be extremely difficult.

The guest speaker suggested that what we may need in order to develop the potential of gifted children is a different framework and orientation. Rather than thinking in terms of an accelerated program or the enrichment of the present one with additional experiences, we might attempt to provide opportunities for the child to function best with his individual gifts. Does he see relationships quickly? Does he deal with concepts easily? Perhaps a basic question that we need to ask ourselves is how shall the gifted child begin differently to form study habits and independent research skills. Grouping of gifted children for at least part of the time was recommended to facilitate the achieving of special skills. Directing the attention of the children to the learning process, as well as to the subject matter, provides opportunities for increased understanding of themselves and for critical evaluations of the meaningfulness of the information being learned. The specialist also discussed such topics as the underachiever, the relationship between the school and the community, the gifted child and leadership, the offering of a smattering of subjects intended to provide a balanced program, and the need for depth. He warned that the development of reflective thinking may be ignored if the emphasis in reading has been placed too heavily upon rate and comprehension.

Faculty members found that the seminars were especially useful in stimulating their thinking about aspects of the program that had not been covered either by their own experiences or their reading. From these discussions and subsequent informal sessions, the group began to crystallize its own working definition of "gifted." An ambitious plan was outlined (and is nearly completed) for the phase of the program that deals with the identification of the gifted children in the school. A roster was developed for every class, in which each child was identified according to the following tests: (1) Stanford-Binet, (2) Stanford Achievement, (3) California Mental Maturity, (4) Otis Quick-Scoring, and (5) the Wechsler. These tests were administered by the school psychologist, who also worked with the faculty in interpreting the results.

The teachers at each grade level prepared a list of criteria that they used to evaluate a pilot group of students. As an example, the list for the sixth grade follows: (1) intelligence quotient; (2) reading ability and eagerness to read; (3) general scholastic excellence; (4) outstanding performance in any area; (5) expressive writing, superior story construction; (6) better-than-average verbal articulation; (7) ability to use reference materials as tools; (8) retention; (9) leadership strength; (10) committee work—(a) organizing, (b) follow-through, and (c) conclusion; (11) originality and creativeness; (12) capacity for assuming responsibility; (13) manual dexterity; (14) keen observation; (15) good sense and judgment; (16) breadth of interests; (17) social maturity; (18) capacity for abstract thinking; (19) intellectual curiosity; and (20) emotional stability. From the lists of criteria submitted by all the teachers, a useful instrument was developed for evaluating each of the children in the school.

A committee of teachers prepared a sociogram. Each student was asked to rate his classmates by placing each in one of the following categories: (1) would like to have him/her as one of my best friends; (2) would like to have him/her in my

group but not as a close friend; (3) would like to be with him/her once in a while but not often or for long at a time; (4) don't mind his/her being in our room but I don't want to have anything to do with him/her; and (5) wish he/she wasn't in our room. He was asked also to rate himself the way he felt most of the class would rate him. He was assured that the teacher would keep the information confidential.

The next report will present the working definitions of the group, the changes in classroom procedures that are being tried, and the plan to include a parent-education phase in the program.

DUES REMINDER

National dues are $3.00. The fiscal year is July 1 through June 30. Members whose dues are not received by February 1 are considered delinquent, and their names are removed from the mailing list for *Educational Horizons*. The bookkeeping system used at the national office does not provide for the payment of dues in advance. Nor are unpaid dues accepted after the close of a fiscal year. A member may become a life member upon the payment of $75.00, either in one payment or in annual installments of $15.00 each over a period of not more than five years. National dues and life membership payments become payable July 1.

The President's Page

PLANS have been initiated for our 1957 Council meeting, which will be held at Teachers College, Columbia University, New York. Dates of the Council meeting will be August 21-24, 1957. Before too long, the Council Planning Committee will be announcing the theme for the 1957 Council so that chapters may give some attention to Council planning during the spring.

It is the hope of the Council Planning Committee that, when delegates participate in the New York meeting, they will have had an orientation to the topics under consideration in their own chapters. It will be extremely helpful if chapters can name their delegates in the spring so that there can be early correspondence between the Council Planning Committee and delegates.

At the August, 1956, Board meeting, Gladys A. Coryell, first vice-president, was invited to be chairman of the Council Program Planning Committee. Serving with Dr. Coryell are Norma Boyle Gibson, Sigma Chapter; Mabel Claire Keefauver, Alpha Delta Chapter; Florence B. Mason, Los Angeles State College; Helen Thompson, Long Beach Alumnæ Chapter; Marjorie Wolfe, Los Angeles Alumnæ Chapter; and Jean S. Williams, Pasadena Alumnæ Chapter.

Marion R. Brown, president of Alpha Epsilon Chapter, Teachers College, Columbia University, has been invited to head the Committee on Arrangements for the Council. The entire membership of this committee will be announced to chapters early in 1957.

If delegates can be named early in the year, their visit to the New York area will be made more enjoyable. Some delegates may wish to travel prior to the Council meeting and will find it necessary to make reservations well in advance. It is also the hope of your national officers that those Pi Lambda Thetans who will be serving as delegates from their chapters will have an opportunity to help decide on Council plans. Delegates will return to their chapters better prepared and with more enthusiasm for reporting if they are thoroughly acquainted with the purposes and plans for the Council meeting.

BERNICE BAXTER

The Teacher's Minute

THE National Education Association will celebrate its centennial anniversary during 1957. A theme has been chosen, "An Educated People Moves Freedom Forward," and a broad program of activities has been planned. Emphasis will be placed on three major objectives: (1) to consider the decisive role of education in a changing world, (2) to stimulate action to provide adequate education for the increasing millions of children, and (3) to strengthen the teaching profession in its service to all people.

Among some thirty projects the National Education Association has planned for the centennial program, the "Teacher's Minute" is one. On April 4, 1957, some 6,000 local education associations throughout the United States will be holding centennial birthday parties to commemorate the founding of the National Education Association. Undoubtedly, some members of your chapter will be included in these groups.

To give additional emphasis and importance to this significant event, it has been suggested that community organizations endorse the "Teacher's Minute." The "Teacher's Minute" means one minute of time set aside in local meetings of many organizations during the week of the birthday party to salute the members of those organizations who are teachers and to salute the teaching profession for its contribution to the advancement of education..

Perhaps your chapter would be interested in talking with service organizations in your locale about this observance. The National Education Association has suggested the following as a possible newspaper release to be used by these groups.

A MINUTE FOR A CENTURY

This week the teachers of America recognize the centennial anniversary of their organized profession, the birthday of the National Education Association, founded in 1857 in Philadelphia. We, members of ..... of ..... give this minute in
(name of organization) (city)
tribute to their part in this century.

We don't know what America would be like without teachers, but we know she would be immeasurably different.

We are glad that someone in America takes responsibility for seeing that doors to better living are opened for every child, no matter how far the latch is above his reach.

We are glad that here someone makes it his business to pass along such enduring intangibles as *understanding, open-mindedness,* and *truth* as the heritage a materially-great nation should bequeath in all humility to its children.

We can attend to our own tasks better, knowing teachers are representing us in seeing that these things are done.

Teachers—we salute you! Our respects to you and your work!

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